85 | Hematemesis, Melena, and Hematochezia

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Definition

Hematemesis is the vomiting of blood, which may be obviously red or have an appearance similar to coffee grounds. *Melena* is the passage of black, tarry stools. *Hematochezia* is the passage of fresh blood per anus, usually in or with stools.

Technique

Hematemesis, melena, and hematochezia are symptoms of acute gastrointestinal bleeding. Bleeding that brings the patient to the physician is a potential emergency and must be considered as such until its seriousness can be evaluated. The goals in managing a major acute gastrointestinal hemorrhage are to treat hypovolemia by restoring the blood volume to normal, to make a diagnosis of the bleeding site and its underlying cause, and to treat the cause of the bleeding as definitively as possible. The history should be directed toward (1) confirming the presence of bleeding; (2) estimating its amount and rapidity; (3) identifying the source and potential specific causes; and (4) eliciting the presence of serious associated diseases that might adversely affect the outcome (Table 85.1). The information obtained is especially helpful in identifying situations that require aggressive management.

Confirming the Presence of Bleeding

The patient having an acute gastrointestinal hemorrhage seeks a physician's help because of hematemesis, melena, or hematochezia, or because of symptoms of hypovolemia such as fainting or lightheadedness. In the patient who may be bleeding profusely and need immediate treatment, directed rather than open-ended questions are appropriate. The examiner should ask the patient if vomiting occurred, if blood or clots were present in the emesis, and if the vomitus looked brown, like coffee grounds, indicating the probable presence of blood. A bloody appearance is readily identified as hematemesis, but the coffee-ground appearance will not be recognized without direct questioning. Hematemesis indicates that the bleeding is from the upper gastrointestinal tract, usually from the esophagus, stomach, or proximal duodenum. Occasionally hemoptysis or vomiting of swallowed blood from epistaxis can be confused with hematemesis. A careful history usually resolves this confusion. Hemoptysis is associated with coughing and is bright, foamy red in color. The patient with profuse epistaxis is almost invariably aware that a nosebleed has occurred.

The direct question, "Are your stools black or bloody?" should be used when active bleeding may be occurring. Make the patient understand that you mean jet black by comparing the stool color to a black object. Melenic stools also have a stickiness that the patient often remembers. Other substances, such as iron or bismuth, can turn the stool black. A melenic stool usually means upper gastrointestinal hemorrhage, whereas hematochezia usually has a colonic source. If slow intestinal transit occurs, melenic stools may be due to bleeding from sites as distal as the cecum. Very rapid upper gastrointestinal hemorrhage, often from an arterial site in a peptic ulcer, may cause hematochezia.

If this brief history suggests acute bleeding, confirm the presence of bleeding through the testing of stool or gastric contents. Nothing, however, should impede the immediate treatment of hypovolemia.

The usual patient seeks a physician's help for reasons other than gastrointestinal bleeding. In this situation, to the extent allowed by the efficient use of time, open-ended questions, such as, "What are your bowel movements like?" or "Have you experienced a change in your bowel movements?" are preferable. It is important to follow with the direct question, "Have you ever had a black or bloody stool?" A similar sequence to elicit hematemesis might be: "Have you vomited during the past year?" If the answer is yes, ask, "What did it look like?" "Was it bloody?" "Was it brown, or did it look like coffee grounds?"

Table 85.1
The History in Gastrointestinal Bleeding

A. Identify the probable presence of bleeding
   1. Hematemesis
   2. Melena
   3. Hematochezia
   4. Hypovolemia (syncope, faintness)
B. Estimate the amount and rapidity of bleeding
   1. Frequency and volume of stools or emesis
   2. Symptoms of hypovolemia
   3. Hematemesis
C. Ask about site and potential causes
   1. Upper gastrointestinal
      a. Melena and/or hematemesis
      b. Symptoms of peptic ulcer, varices, gastritis, esophagitis, Mallory–Weiss tears, and malignancy
   2. Lower intestinal
      a. Hematochezia
      b. Symptoms of arteriovenous malformations, diverticulosis, cancer, hemorrhoids, inflammatory bowel disease, ischemic colitis
D. Determine the presence of diseases or situations having poorer prognosis
   1. Congestive heart failure or prior myocardial infarction
   2. Chronic obstructive lung disease
   3. Cirrhosis
   4. Renal failure
   5. Advanced malignancy
   6. Age over 60 years
   7. Clotting disorder

Direct questions are the best approach to hematochezia. After asking about bowel habits, ask, "Have you observed blood in or on your stools or on the toilet paper?" and then, "Do you sometimes bleed from the rectum without passing stool?"

Amount and Rapidity of Bleeding

While confirmation of bleeding and, if necessary, resuscitation of the patient is proceeding, the examiner should estimate the amount and rapidity of bleeding. Ask the patient about the number of bloody stools passed or the times vomited, the frequency, and the amount of blood passed with each. Encourage an estimate in terms of common measures such as teaspoon, tablespoon, or cup. The physician must understand that the answers to these questions, while possibly reassuring, do not predict the amount or rapidity of hemorrhage yet to occur. Symptoms of hypovolemia indicate that a major hemorrhage has already occurred. The combination of hematemesis with melena, or red hematemesis alone, also suggests a major hemorrhage. Hematochezia, although it may be massive, usually presents as minor bleeding that is important because it may have come from a rectal or colonic neoplasm. Direct questions regarding the frequency, amount, and duration of hematochezia should allow the examiner to determine whether the patient is having a major life-threatening hemorrhage or only acute or chronic minor bleeding.

Source and Potential Causes

While the patient is being treated, the history should be continued to determine the source and potential causes. Melena strongly suggests, and hematemesis confirms, that bleeding is of upper gastrointestinal origin. In this situation, seek historical evidence for common causes such as peptic ulcer, cirrhosis with esophageal or gastric varices, gastritis, esophagitis, Mallory–Weiss tears, and malignancy. Peptic ulcer, the most common cause of gastrointestinal hemorrhage, should be pursued through questions about epigastric distress, the relationship of symptoms to food intake, and a past history of peptic ulcer disease. Patients with liver disease may have varices, a source of bleeding. Ask about known varices or cirrhosis, alcoholism, and previous hepatitis. The Mallory–Weiss tear usually occurs after retching or vomiting, and is often associated with heavy alcohol ingestion. Aspirin and the nonsteroidal anti-inflammatory agents can also cause gastric mucosal injury and predipose to bleeding through their effect on platelet function. These drugs should be removed from the patient's treatment regimen to enhance healing and prevent future episodes of gastrointestinal hemorrhage. Heavy alcohol intake, severe burns, extensive central nervous system injuries, and many other serious illnesses predispose to hemorrhage gastritis. Patients bleeding from esophagitis or esophageal ulcers usually have a long history of heartburn. Weight loss and anorexia suggest gastric cancer when associated with upper gastrointestinal hemorrhage, although similar symptoms can be found in patients with peptic ulcer.

Hematochezia usually comes from a colonic site, although blood rapidly transported from the upper gastrointestinal tract can be red when passed. In older patients, massive lower intestinal hemorrhage is frequently caused by a bleeding diverticulum or an arteriovenous malfor-

mation. Diverticular bleeding, being arterial, tends to be brisk, whereas a history of repeated, often smaller hemorrhages is more typical of an arteriovenous malformation. Less common causes of massive colonic hemorrhage include cancer and ischemic colitis. A history suggestive of inflammatory bowel disease should be sought in all patients.

With minor rectal bleeding, direct the questions at causes such as cancer, neoplastic polyps, inflammatory conditions, and hemorrhoids. It is helpful to know whether the blood is mixed into the stool, suggesting a colonic lesion, or whether it merely covers the stool or is on the toilet paper, suggesting hemorrhoids or a rectal lesion. Other symptoms that may be helpful include diarrhea, a change in bowel habits, abdominal pain, and systemic symptoms such as fever and weight loss.

Children with gastrointestinal hemorrhage merit special consideration. Exsanguinating hemorrhage is uncommon in children. In neonates, bleeding usually subsides spontaneously. A spurious cause of bleeding during the first several days of life is vomiting of blood swallowed at birth. The maternal source of blood can be determined by checking for fetal hemoglobin, not present in maternal blood. Serious causes of hematochezia in the neonate include necrotizing enterocolitis and midgut volvulus. A wide variety of causes of hemorrhage occur as children grow older. Causes relatively unique to children are intussusception, Meckel's diverticulum, and juvenile polyps. A history of chronic inflammatory bowel disease should also be sought.

The diagnostic accuracy of the history in gastrointestinal bleeding is sufficiently low to make appropriate tests indicated. The risk of missing a serious, treatable lesion is too high to warrant dependence on the history and physical examination for diagnosis. The increasing availability of nonoperative interventions such as sclerosis of varices and coagulation of bleeding lesions makes accurate diagnosis more important in management of acute massive gastrointestinal hemorrhage.

Presence of Serious Associated Diseases

Ask the patient about advanced malignancies and diseases of the heart, liver, kidneys, or lungs because their presence can substantially alter therapy and affect the outcome of the patient who is bleeding rapidly. Previous or present myocardial infarction, congestive heart failure, cirrhosis, chronic obstructive lung disease, or renal failure each markedly increase the risk of a major gastrointestinal hemorrhage, and their presence can alter the decision regarding early operation when bleeding continues. Age also is an important consideration because most deaths occur in patients over 60. An underlying defect in the blood coagulation system should also be sought. A bleeding tendency may be an unappreciated adverse factor in patients with gastrointestinal hemorrhage. Patients must be asked about anticoagulant use. Correction of a clotting disorder may be important to stopping the hemorrhage.

Basic Science

Melena is the most common presenting symptom of major gastrointestinal hemorrhage. About 90% of quantitatively important gastrointestinal bleeding episodes occur from sites above the ligament of Treitz. Melena usually means bleeding from this location. It takes 50 ml or more of blood in

the stomach to turn stools black. One to two liters of blood administered orally will cause bloody or tarry stools for up to 5 days, the first such stool usually appearing within 4 to 20 hours after ingestion. Thus, a melenic stool is indicative of recent hemorrhage but does not indicate the presence or rapidity of bleeding at the time of passage. Administration of blood into the small intestine or cecum can cause melena if the blood remains in the intestine long enough. This makes the hypothesis untenable that melena is caused by the effect of gastric acid and pepsin on blood. Although melena usually means upper gastrointestinal hemorrhage, the small intestine and cecum should be studied if no cause for bleeding is found in the esophagus, stomach, or duodenum.

Hematemesis confirms an upper gastrointestinal location of the bleeding and suggests that the hemorrhage is large. In one small study, all six patients with hematemesis had lost more than a quarter of their red cell volume. The size of the hematemesis gives a further indication of the extent of the hemorrhage. In general, vomiting of red blood is more ominous.

The most important complication of hemorrhage is circulatory impairment with tissue hypoxemia. Melena, hematemesis, or hematochezia indicates that a potentially lethal situation may be developing. A 15% loss of blood volume is usually readily tolerated and compensated by contraction of large veins and recruitment of fluid from extravascular sites. As the volume depletion becomes greater, constriction of arterioles, shunting of cardiac output from nonvital areas such as skin and bone, tachycardia, decreasing cardiac output, and orthostatic hypotension occur. The patient is likely to be thirsty and feel faint when standing. After 40 to 50% depletion of blood volume, complete loss of the ability to compensate occurs with shock, impaired flow of blood to vital organs, tissue hypoxemia, lactic acidosis, and ultimately, death.

Rapid correction of blood volume is essential. In dogs, irreversible changes occur within 4 hours after a phlebotomy that maintains a reduction of 35 mm Hg mean arterial pressure. Earlier transfusion will save most of the animals. The role of many homeostatic mechanisms and pathogenetic mediators in the response to hypovolemic shock is just beginning to be elucidated. These mediators include catecholamines, renin, complement, kinins, and lysosomal enzymes. The goal of therapy is to protect each link in the delivery of oxygen to cells by restoring and maintaining normal blood volume.

Clinical Significance

A convincing description of hematemesis, melena, or substantial amounts of hematochezia indicates bleeding that is a potential emergency and should be handled as such until the situation can be assessed. This is the most important inference to be made from the history in gastrointestinal hemorrhage. Mortality from acute upper gastrointestinal hemorrhage is between 8 and 10%, but varies widely with age and with the presence or absence of serious associated diseases such as renal failure, malignancy, congestive heart failure, or cirrhosis. The majority of deaths occur in patients over age 60. Older patients are less able to withstand massive hemorrhage and surgical intervention.

The description of acute hemorrhage should trigger three management steps. First, restore and maintain normal blood volume. A history suggesting an active gastrointestinal hem-

orrhage should alert the physician to the immediate need for treatment of hypovolemia and shock. Next, the site and cause of the bleeding should be established. This is becoming increasingly important as methods using interventional endoscopy or radiology are developed to stop hemorrhage. Finally, a treatment regimen should be planned, based on diagnosis and the condition of the patient. This regimen might include pharmacologic therapy to reduce gastric acidity, endoscopic coagulation of bleeding ulcers or sclerosis of varices, embolization of bleeding vessels using angiography, or operation. The regimen must also provide for long-term management of the underlying disease.

The causes of gastrointestinal hemorrhage are numerous (Tables 85.2 and 85.3). Although each may be suggested by details obtained during the history, diagnostic tests are required to confirm the clinical impression. Passage of a nasogastric tube is a simple but often neglected method of demonstrating that bleeding is upper gastrointestinal. A

Table 85.2
Common Causes of Upper Gastrointestinal Hemorrhage

Adults
Duodenal ulcer
Esophageal or gastric varices
Gastric ulcer
Gastritis
Esophagitis
Laceration of the gastroesophageal junction (Mallory–Weiss syndrome)
Gastric tumors

Children
Esophagitis
Gastritis
Peptic ulcer
Esophageal or gastric varices

Neonates
Blood swallowed during delivery

Table 85.3
Causes of Hematochezia

Adults
Internal hemorrhoids
Vascular malformation
Diverticulosis
Infections (campylobacter, shigellosis, amebiasis)
Anal fissures
Chronic ulcerative colitis
Granulomatous colitis
Adenocarcinoma
Benign tumors
Ischemic colitis
Upper tract lesion (massive bleeding)

Children
Juvenile polyps
Chronic ulcerative colitis
Granulomatous colitis
Infections
Intussusception
Meckel's diverticulum

Neonates
Anal fissure
Necrotizing enterocolitis
Midgut volvulus

negative gastric aspirate does not exclude an upper gastrointestinal source because the bleeding may have stopped or because blood from the duodenum may not be entering the stomach.

Esophagogastroduodenoscopy is the preferred method for diagnosis of upper gastrointestinal hemorrhage. With the development of therapeutic endoscopic techniques, an aggressive stance favoring early endoscopy for diagnosis in all patients makes sense. Proctoscopy will demonstrate bleeding from hemorrhoids, rectal lesions, and ulcerative colitis. Active colonic bleeding is frequently from above the reach of the proctoscope and makes colonoscopy difficult by impeding the view, although modern methods of bowel preparation have partially overcome this problem. Either an isotopic study, using labeled erythrocytes, or angiography may be helpful during active colonic hemorrhage, but these techniques have limitations. Angiography requires active and substantial bleeding to be diagnostic. With the radioisotopic study, intermittent bleeding will allow a positive test, but precise localization of the site is difficult. Colonoscopy should be used if bleeding ceases. Barium studies make subsequent angiography or endoscopy difficult and should be avoided.

Patients who have bled need attention to their long-term management as well as to the medical emergency that the hemorrhage constitutes. Optimal care requires development of a long-term treatment plan that maximizes wellness and minimizes the morbidity of the underlying disease. If the bleeding does not stop, operation is usually indicated. Bleeding, however, will stop or can be stopped in the majority of patients. At this point, it becomes important to manage the underlying disease aggressively. Acid-peptic disease should be treated to prevent recurrences by use of prolonged pharmacologic therapy. Until further controlled studies become available, esophageal varices should be obliterated by endoscopic sclerosis and the underlying liver disease treated to lower portal pressure. Shunt procedures are rarely needed. Precipitating causes, such as analgesic use, should be avoided. The patient must be educated about bleeding so that early therapeutic intervention is possible during a recurrence.

References

Allan R, Dykes P. A study of the factors influencing mortality rates from gastrointestinal haemorrhage. Q J Med 1976;45:533–50.

Boley SJ, Sammartano R, Adams A, DiBiase A, Kleinhaus S, Sprayregen S. On the nature and etiology of vascular ectasias of the colon. Degenerative lesions of aging. Gastroenterology 1977;72:650–60.

Collins JA. The pathophysiology of hemorrhagic shock. Prog Clin Biol Res 1982;108:5–29.

Hilsman JH. The color of blood-containing feces following the instillation of citrated blood at various levels of the small intestine. Gastroenterology 1950;15:131–34.

McKhann CF, Wilson ID. A rational approach to gastrointestinal bleeding emergencies. Hosp Pract 1971;6:125–37.

Oldham KT, Lobe TE. Gastrointestinal hemorrhage in children. A pragmatic update. Pediatr Clin North Am 1985;32:1247–63.

*Peterson WL. Gastrointestinal bleeding. In: Sleisenger MH, Fordtran JS, eds. Gastrointestinal disease, 3d ed. Philadelphia: W. B. Saunders, 1983;177–207.

Runciman WB, Skowronski GA. Pathophysiology of haemorrhagic shock. Anaesth Intensive Care 1984;12:193–205.

Schiff L, Stevens RJ, Shapiro N, Goodman S. Observations on the oral administration of citrated blood in man. II. The effect on the stools. Am J Med Sci 1942;203:409–12.

Tedesco FJ, Waye JD, Raskin JB, Morris SJ, Greenwald RA. Colonoscopic evaluation of rectal bleeding. A study of 304 patients. Ann Intern Med 1978;89:907–9.

Wara P, Stodkilde H. Bleeding pattern before admission as guideline for emergency endoscopy. Scand J Gastroenterol 1985;20:72–78.